REMARKS

In the Office Action, the Examiner noted that claims 1-18 were pending in the application and the Examiner rejected all claims. Claim 19 was withdrawn from consideration as being directed to a non-elected invention. By this Amendment, various claims have been amended. Thus, claims 1-18 are pending in the application. The Examiner's rejections are traversed below.

REJECTION UNDER 35 U.S.C. § 102

In items 4-14 on pages 3-8 of the Office Action, the Examiner rejected claims 1-4, 9, 12-14 and 18 under 35 U.S.C. § 102 as anticipated by U.S. Patent 5,943,162 to Kosaka et al.

THE PRESENT INVENTION

The present invention as set forth, for example, in claim 1 is directed to an optical amplifier having a polarization mode dispersion compensation function. Claim 1 has been amended to recite that the optical amplifier includes a polarization control section that controls a polarization plane angle of input signal light to produce variable polarization states. These features are supported, for example, in the paragraph spanning pages 7 and 8 of the specification.

THE KOSAKA ET AL. REFERENCE

The Kosaka et al. reference is directed to an optical amplifier, optical amplifying method and optical transmission system using the optical amplifier. Figure 2 of Kosaka et al. is a diagram showing a basic configuration of an optical amplifier 1 and an input port 2 for receiving transmitted signal light. A polarized-wave identifying/synthesizing unit 3 receives the transmitted signal light and synthesizes the signal lights into signal lights with their polarization states discriminatable from each other for one or more output ports. The signal lights with discriminatable polarization states are applied to a polarization maintaining optical amplifying medium 4 for optically amplifying the signal lights with their polarization states maintained. The polarization maintaining optical amplifier medium 4 is excited by an exciting unit 6 for selectively exciting the signal lights by using exciting lights introduced by way of an introduction unit 5. The amplified signal lights are then supplied to the polarized-wave separating unit 7 by way of the introduction unit 5. The polarized-wave separating unit 7 identifies the polarization states of the

optically amplified signal lights coming from the polarization maintaining optical amplifying medium 4, and separates the signal lights from each other before supplying them to a branching unit 8 for splitting. Some of the lights split by the branching unit 8 are supplied to a detection unit 9 for monitoring the split lights. The split lights are then supplied to a controller 10 for controlling the exciting unit 6 so as to adjust the amplified signal lights to predetermined values. (Column 8, line 47 to column 9, line 33).

THE PRIOR OFFICE ACTION AND RESPONSE

In response to the previous prior art rejections, the applicants made the following arguments for patentability:

1. The claimed polarization control section does not correspond to the polarized-wave identifying/synthesizing unit 3 of Kosaka because the unit 3 is not provided with the function of making specific polarization states variable.

2. The controller 10 in Kosaka, which the Examiner alleges to correspond to the claimed control section, does not control unit 3 (which the Examiner alleges to correspond to the claimed polarization control section) as recited in claim 1.

3. The polarization states of the input signal lights of the invention are variably controlled by the polarization control section and therefore the differential group delay given between orthogonal polarization mode components of the signal light by the polarization mode dispersion generation section can be made optimum. As a result, the polarization mode dispersion compensation of the signal lights is performed.

THE EXAMINER'S RESPONSE IN THE CURRENT OFFICE ACTION

In item 18 on pages 9 and 10 of the Office Action, the Examiner has responded to two of the three prior arguments for patentability. With respect to arguments 1 and 3 above, the Examiner has taken the position that column 9, lines 5-12 and 34-46 disclose that the unit 3 of Kosaka is provided with the function of making specific polarization states variable. In particular, the Examiner relies upon column 9, lines 34-41 of Kosaka which state:

> According to the configuration described above, the polarized-wave identifying/synthesizing unit 3 makes the polarization states of the individual transmitted signals conveying pieces of information different from each other discriminatable from each other as well as maintainable before supplying them to the polarization maintaining optical amplifying medium 4 which is excited by the exciting unit 6 through the introduction unit 5.

CLAIM 1 PATENTABLY DISTINGUISHES OVER THE PRIOR ART

It is submitted that Kosaka et al. does not teach or suggest the claimed polarization control section that controls a polarization plane angle of input signal light to produce variable polarization states. In addition, Kosaka et al. does not teach or suggest the claimed monitoring section that monitors a polarization mode dispersion generation state of the signal light output from the polarization mode dispersion generation section, or a control section that controls the polarization control section so that polarization mode dispersion monitored in the monitoring section, is reduced.

On page 10 of the Office Action, the examiner takes the position that the above-quoted language at column 9, lines 34-41 of Kosaka which states that the polarization states are "discriminatable" from each other corresponds to the previously claimed feature "a polarization control section that controls a polarization state of input signal light."

In order to more clearly recite the differences between the present claimed invention and the prior art, the first paragraph of claim 1 has been amended to recite "a polarization control section that controls a polarization plane angle of input signal light to produce variable polarization states."

From the Examiner's response in item 18 on pages 9 and 10 of the Office Action, it appears that the Examiner is taking the position that the polarized-wave identifying/synthesizing unit 3 of Kosaka et al. which multiplexes an input signal light at polarized-wave identifiable states, corresponds to the claimed polarization control section. However, the "polarized-wave identifiable state" of the polarized-wave identifying/synthesizing unit 3 of Kosaka et al. refers to the transmission of only signal lights of a specific polarization state from input signal lights at an arbitrary polarization mode. This is done by giving the input signal lights to polarizers 12a and 12b and dominating planes of polarization of two signal lights passing through the polarizers 12a and 12b are mutually orthogonal as indicated in Figures 3 and 4 (see column 10, lines 4-7 and 28-39). Accordingly, the polarized-wave identifying/synthesizing unit 3 of Kosaka et al. actually performs the function of outputting signal lights input at arbitrary polarization modes into a polarization maintaining optical amplifying medium 4 by fixing the signal lights to a specific polarization state. Thus, the polarized-wave identifying/synthesizing unit 3 of Kosaka et al. does not have any function for making a specific polarization state variable. This is further supported by the disclosure of Kosaka et al. which states that the powers of the output signal lights are detected by the detection unit 9, and the exciting unit 6 is controlled by the controller 10, so that the detected powers of the output signal lights are maintained at predetermined levels as described in column 11, lines 54-61 of Kosaka et al. Thus, the polarization states of the output

signal lights are not monitored by the detection unit 9, and the polarized-wave identifying/synthesizing unit 3 is not controlled by the controller 10 of Kosaka et al.

With respect to the prior argument 2 above, in the current Office Action the Examiner has not responded to the applicants' position that the controller 10 of Kosaka et al. does not control the polarized-wave identifying/synthesizing unit 3 of Kosaka. Therefore, the applicants maintain that Kosaka et al. does not teach or suggest the claimed control section which "controls said polarization control section so that polarization mode dispersion monitored in said monitoring section, is reduced."

In the present claimed invention as set forth in claim 1, the polarization states of the input signal lights are variably controlled by the polarization control section and therefore the differential group delay given between orthogonal polarization mode components of the signal light by the polarization mode dispersion generation section can be made optimum. As a result, the polarization mode dispersion compensation of the signal lights is performed. This kind of polarization mode dispersion compensation function cannot be exhibited by the optical amplifier of Kosaka et al. In particular, it is submitted that Kosaka et al. does not teach or suggest:

> a polarization control section that controls a polarization plane angle of input signal light to produce variable polarization states; . . .
> a monitoring section that monitors a polarization mode dispersion generation state of the signal light output from said polarization mode dispersion generation section; and
> a control section that controls said polarization control section so that polarization mode dispersion monitored in said monitoring section, is reduced.

In view of the above, it is submitted that claim 1 patentably distinguishes over the prior art.

Claim 18, as amended, is directed to an optical amplifier which includes:

> a polarization control section that controls a polarization plane angle of input signal light to produce variable polarization states;
> a polarization mode dispersion generation section having an optical transmission medium with a rare earth element;
> a pumping light supply section that applies pumping light to the optical transmission medium;
> a monitoring section that monitors a polarization mode dispersion generation state of the signal light output from said polarization mode dispersion generation section; and
> a control section that controls said polarization control section, so that polarization mode dispersion monitored in said monitoring section, is reduced.

Therefore, it is submitted that claim 18 patentably distinguishes over the prior art.

CLAIMS 2-4, 9 AND 12-14

Claims 2-4, 9 and 12-14 depend directly or indirectly, from claim 1 and include all the features of that claim plus additional features which are taught or suggested by the prior art. Therefore, it is submitted that claims 2-4, 9 and 12-14 patentably distinguish over the prior art.

REJECTIONS UNDER 35 U.S.C. § 103

On pages 8 and 9 of the Office Action, the Examiner rejected claims 5-8, 10-11 and 15-17 under 35 U.S.C. § 103 as unpatentable over various combinations of Kosaka and U.S. Patent No. 6,301,273 to Sanders et al. and U.S. Patent Application No. 10/854,347 to Hwang et al.

Claims 5-8, 10-11 and 15-17 depend, directly or indirectly, from claim 1 and include all the features of that claim plus additional features which are not taught or suggested by the prior art. Further, it is submitted that neither Sanders nor Hwang et al. cure the deficiencies of Kosaka et al. Therefore, it is submitted that claims 5-8, 10-11 and 15-17 patentably distinguish over the prior art.

SUMMARY

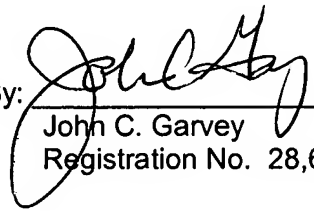
It is submitted that none of the references, either taken along or in combination, teach the present claimed invention. Thus, claims 1-18 are deemed to be in a condition suitable for allowance. Reconsideration of the claims and an early notice of allowance are earnestly solicited.

If there are any additional fees associated with filing of this Amendment, please charge the same to our Deposit Account No. 19-3935.

Respectfully submitted,

STAAS & HALSEY LLP

Date: March 8, 2006

By: 

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